FISHERY MANAGEMENT PLAN

Hillside National Wildlife Refuge
Yazoo City, MS

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SUMMARY STATEMENT

Hillside National Wildlife Refuge occupies 15,383 acres of west central Mississippi in the Mississippi/Yazoo River alluvial plain. The refuge is situated between loess bluff hills and the U.S. Army Corps of Engineers Hillside Floodway levee in Holmes and Yazoo Counties.

The alluvial soils of the area are high in natural fertility and have clay to silt loam textures. Over 10,000 acres are seasonally flooded and hence not managed for fish. There are 78 borrow ponds, approximately one acre each, the upper 46 of which have been managed in the past. However, flood waters have inundated these ponds several times in past years, and undesirable fish species have reinhabited and now dominate. The rich ponds average over 400 pounds of fish each, and it is believed that a low (4 to 5') levee to preclude floodwater would allow development of a highly productive sport fishery that would yield over 15,000 pounds of bass, bream, and catfish to anglers annually.

INTRODUCTION

This management plan was prepared by The Natchitoches Fishery Assistance Office in conjunction with personnel from Hillside National Wildlife Refuge, and is an update of a 1980 Fishery Management Plan. Information and data were obtained from the 1980 plan and various other documents.

GOALS AND OBJECTIVES

To manage the borrow bonds to enhance both fishery and waterfowl resources.

Subgoal A

Construct a levee system to prevent flooding and facilitate fishery management of the borrow ponds.

Fishery Habitat

There are over 10,000 acres of wetland area subject to seasonal flooding on Hillside Refuge. Perennial streams are Fannegusha and Black Creek entering from the east, and Tipton Bayou from the north which converge to form Parker Bayou, a tributary of the Yazoo River. Tcheva Creek is immediately south of the refuge and seasonally floods a portion of the refuge. Considerable Corps of Engineers ditching has combined Fannegusha

and Black Creek into Black Creek Ditch for approximately five miles prior to joining Parker Bayou. Some 78 borrow pits ranging in size from 0.5-1.5 acres each were created in building the Hillside Floodway levee. In the early 1980's, 46 of these ponds which were least apt to flood were renovated and restocked with sport fish. However, a nearby dredging project by the U.S. Army Corps of Engineers within two years of pond renovations caused faster rising and higher waters to inundate the ponds. Commercial species of fish such as buffalo and carp had reinhabited and dominated the fish populations of these ponds by the mid 1980's. Without a levee system to prevent reflooding, sport fish populations will continue to provide only a small fraction of potential angler benefits. Appendix I shows the composition of fish populations in the ponds in 1979 prior to renovation. Undesirable species made up 90% of the population. Following renovation and stocking in 1979 and 1980, the sport fish populations were spawning and growing well (Appendix II). However, by 1984 and '85 (Appendix III), encroachment and growth of undesirable species had shifted the population back to pre-renovation conditions. By eliminating the flooding conditions, the 78 borrow ponds, which average about 400 pounds of fish each, could potentially support a total of approximately 31,000

pounds of sport fish. Such a situation would allow anglers to harvest around 15,000 pounds of fish yearly from these fertile ponds.

To realize the above fishery benefits, it is necessary that floodwaters be kept out of the borrow ponds. An adequate levee along the east side of the ponds with cross levees and water control structures every nine ponds would allow for proper pond management. The levee could be extended to include as many ponds as possible, taking into consideration required levee height, cost of construction, etc.. Likewise, it should be pointed out that each pond included in an adequate levee system would yield to anglers approximately 10,000 pounds of fish over a 50-year project life. Perhaps the U.S. Army Corps of Engineers would construct the levee system as a mitigation feature.

The present practice of seeding millet on bottom muds as they become exposed during the summer should continue for both waterfowl and fishery benefits.

Plan Element A - Borrow Ponds

Strategy IA - Surveys and Inventories

Task I - Compile a species list of fish found on the refuge and surrounding waters, and put in brochure form.

Strategy IIA - Habitat Management

Task I - Construct a levee system of adequate height to restrict flood waters. Run a north/south levee on the east side of the ponds.

Task II - Construct cross levees every nine ponds to make separately manageable units.

Task III - Install water control structures in the levee on the east side of the ponds at the lowest (south) end of each nine-pond series.

Task IV - As in the upper ponds, cut banks to connect three ponds together to facilitate boat passage. Banks should be cut where water is deep.

Strategy IIIA - Population Management

Task I - Conduct a total renovation of all ponds when the levee system is completed and

restock with largemouth bass, bluegill redear sunfish, and channel catfish.

Task II - Initiate a 14-inch minimum length limit on bass.

Task III - Maintain a proportional stock density between 30 to 60 percent.

Task IV - Discontinue commercial netting.

Task V - Add a large bale (roll) of hay in shallow (2') water in the central pond of each three-ponds series.

Strategy IVA - Protection

Task I - Enforce 14-inch minimum length limit on largemouth bass.

Strategy VA - Public Use

Task I - Maintain mowed access to the ponds.

Task II - Continue to allow fishing from boats.

Task III - Place litter containers in appropriate areas.

Strategy VIA - Research

Task I - Compare fish populations between three-pond series where no hay or millet is provided and series where it is provided.

Strategy VIIA - Education and Involvement

Task I - Explain to anglers the need to manage bass harvest so that bluegill and redear sunfish populations do not become stunted.

Task II - Advertise in refuge office, National Fishing Week, which occurs in June of each year.

FISHERY MANAGEMENT PLAN

SUMMARY AND IMPLEMENTATION SCHEDULE

Hillside National Wildlife Refuge

Yazoo City, MS

Goals/Subgoals	Strategies & Tasks	Organizational Unit (Lead/Sup) NWR	FAO	LE	FWE	RES	STATE	Responsible Office	Date/Funding/FTEs
GOAL: To manage borrow ponds to enhance both fishery and waterfowl resources.	STRATEGY IA. Surveys and Inventories								
	TASK I - Compile species list of fish found on refuge and in surrounding waters, and put in brochure form	S	L					FAO	1990-1995/500/.01
	STRATEGY IIA. Habitat Management								
SUBGOAL A: Construct a levee system to prevent flooding and facilitate fishery management of the borrow ponds.	TASK I - Construct levee system to restrict flood waters.	L			S			NWR	
	TASK II - Construct cross levees every nine ponds.	L						NWR	
	TASK III - Install water control structures in levee on east side of ponds.	L						NWR	
	TASK IV - As in upper ponds, cut banks to connect three ponds together to facilitate boat passage.	L						NWR	
	STRATEGY IIIA. Population Management								
	TASK I - Conduct total renovation of all ponds and restock with largemouth bass, bluegill, redear sunfish, and channel catfish.	S	L					FAO	1992-1993/5,500/.1
	TASK II - Initiate a 14-inch minimum length limit on bass	L		S		S		FAO	
	TASK III - Maintain a proportional stock density between 30 to 60 percent.	L						FAO	
	TASK IV - Discontinue commercial netting.	L						FAO	
	TASK V - Add a large bale of hay in shallow water in central pond of each three-pond series.	L						FAO	

FISHERY MANAGEMENT PLAN
SUMMARY AND IMPLEMENTATION SCHEDULE

Refuge: Hillside National Wildlife Refuge

Goals/Subgoals	Strategies & Tasks	Organizational Unit (Lead/Sup) NWR	FAO	LE	FWE	RES	STATE	Responsible Office	Date/Funding/FTEs
GOAL: To manage borrow ponds to enhance both fishery and waterfowl resources. SUBGOAL A: Construct a levee system to prevent flooding and facilitate fishery management of the borrow ponds.	STRATEGY IVA. Protection TASK I - Enforce 14-inch minimum length limit on largemouth bass.	L		S			S	NWR	
	STRATEGY VA. Public Use TASK I - Maintain mowed access to the ponds	L						NWR	
	TASK II - Continue to allow fishing from boats.	L						NWR	
	TASK III - Place litter containers in appropriate areas.	L						NWR	
	STRATEGY VIA. Research TASK I - Compare fish populations between three-pond series where no hay or millet is provided and series where it is provided.	S	L					FAO	1993-1995/3,500/.08
	STRATEGY VIIA. Education and Involvement TASK I - Explain to anglers the need to manage bass harvest so that bluegill and redear sunfish populations do not become stunted.	L	S	S			S	NWR	
	TASK II - Advertise in refuge office, National Fishing Week.	L						NWR	

APPENDIX I

TYPICAL POND ROTENONE SAMPLE (FIRST DAY ONLY)
IN 1979 PRIOR TO RENOVATION

Pond 35

Species	Average Weight	Total Weight	Per Cent of Total Weight
Bigmouth Buffalo	2.4	96.5	29
Smallmouth Buffalo	3.1	65.0	20
Gizzard Shad	.1	62.5	19
Carp	2.5	61.0	18
White Crappie	.05	21.5	6
Channel Catfish	.7	14.5	4
Spotted Gar	.9	7.0	2
Largemouth Bass	.5	.5	1
Sunfish	.01	.5	1
Other (Yellow Bullhead, Madtom)	-	.1	-
Total		331.6 lbs.	

APPENDIX II

SPRING SEINE SAMPLES TWO YEARS POST RENOVATION

Pond 42

12 Foot Seine (3 hauls)

	1-3"	4-5"	6-7"
Largemouth Bass	7		
Bluegill	55		

50 Foot Seine (2 hauls)

	1-3"	4-5"	6-7"
Bluegill	15	12	1
Redear Sunfish			1
Gizzard Shad	1		

Pond 48

12 Foot Seine (2 hauls)

	1-3"
Largemouth Bass	8
Bluegill	35

50 Foot Seine (1 haul)

	1-3"	4-5"	6-7"
Bluegill	15	5	1
Redear Sunfish	2	3	2

Pond 62

12 Foot Seine (4 hauls)

	Fry	1-3"	4-5"	6-7"
Largemouth Bass	100	4		
Bluegill/Redear Sunfish	1000	100	4	2

50 foot seine - not successful due to excessive stumps and logs.

APPENDIX III

POND ROTENONE SAMPLES IN 1985 SHOWING REINVASION
BY UNDESIRABLE SPECIES

Pond 43

Species	Number	Size Range (In.)	Wt. (Lbs.)
Bigmouth/Smallmouth buffalo	52	18-27	290 (5.8 lb. ave.)
Common Carp	3	20-25	17
Spotted Gar	6	19-24	18
Yellow Bullhead catfish	1	13	1
Gizzard Shad	100's	3-11	80+
White crappie	100+	3- 7	-
Channel catfish	6	9-17	10
Redear sunfish	7	6- 7	-
Redear sunfish	25+	3- 5	-
Bluegill	5	6- 7	-
Bluegill	50+	3- 5	-
Largemouth bass	31	3-11	-
Largemouth bass	5	12-19	10
		TOTAL	426 lbs.

Pond 70

Species	Number	Size Range (In.)	Wt. (Lbs.)
Bigmouth/Smallmouth buffalo	43	16-25	176 (4.1 lb. ave.)
Common carp	34	18-27	102
Spotted gar	17	15-26	30
Yellow bullhead	3	12-14	3.3
Bowfin	1	15	2
Gizzard shad	100's	3-13	60+
White crappie	100+	3- 8	-
Channel catfish	7	12-18	21.5
Redear sunfish/bluegill	100's	1- 5	-
Largemouth bass	2	3-11	-
Largemouth bass	10	12-18	21
		TOTAL	415 lbs.